

# SIRIM COUNTERFEIT STICKER DETECTOR

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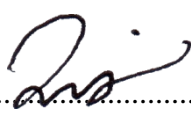
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## ABSTRACT

Nowadays there are many electronic or electrical equipment that we didn't know its quality and safety of using it. SIRIM Berhad is the one and only organization that provides a comprehensive compliance testing for electrical and electronic products in Malaysia. Therefore, if the equipment is guaranteed safe, the genuine SIRIM sticker is provided and attach to the electronic and electric equipment. This device is to detect authenticity of the sticker. This device is detecting the visual of the SIRIM sticker to read the code number on the SIRIM sticker and find the codes number available in the database, so it is certified authentic. But if it does not, it feared counterfeit SIRIM sticker. The method used in this project is optical character recognition OCR which means it will recognize the SIRIM ID number that exists in the sticker. The number that has been recognized will be search in the database to show the information. The databases are developing by using Microsoft Excel and integrate it with MATLAB.

## ABSTRAK

Pada masa kini terdapat banyak peralatan elektronik atau elektrik yang kita tidak tahu kualiti dan keselamatan menggunakannya. SIRIM Berhad adalah satu-satunya organisasi yang menyediakan proses penyelarasan menyeluruh bagi produk elektrik dan elektronik untuk menepati piawaian. Oleh itu, jika peralatan dijamin selamat, SIRIM pelekat tulen disediakan dan melampirkan kepada peralatan elektronik dan elektrik. Projek ini bertujuan untuk mengesan kesahihan pelekat SIRIM tersebut. Alat ini akan mengesan visual pelekat SIRIM dan menganalisis untuk membaca kod nombor pada pelekat SIRIM tersebut dan mendapati kod ombor tersebut terdapat dalam pangkalan data, jadi ia disahkan tulen. Akan tetapi jika ia tidak, ia di khawatiri pelekat SIRIM palsu. Kaedah yang digunakan dalam projek ini adalah ciri optik pengenalpastian (OCR) yang bermakna ia akan mengenalpasti nombor ID SIRIM yang wujud di pelekatnya. Bilangan yang telah diiktiraf akan di cari dalam pangkalan data untuk menunjukkan maklumat. Pangkalan data dibangunkan dengan menggunakan Microsoft Excel dan mengintegrasikan dengan MATLAB.



## TABLE OF CONTENTS

CHAPTER	TITLE	PAGE
	<b>PROJECT TITLE</b>	<b>i</b>
	<b>CONFORMATION REPORT STATUS</b>	<b>ii</b>
	<b>DECLARATION</b>	<b>iii</b>
	<b>SUPERVISORS CONFORMATION</b>	<b>iv</b>
	<b>DEDICATION</b>	<b>v</b>
	<b>ACKNOWLEDGEMENT</b>	<b>vi</b>
	<b>ABSTRACT</b>	<b>vii</b>
	<b>ABSTRAK</b>	<b>viii</b>
	<b>TABLE OF CONTENTS</b>	<b>ix</b>
	<b>LIST OF TABLE</b>	<b>xiv</b>
	<b>LIST OF FIGURE</b>	<b>xv</b>
	<b>LIST OF ABBREVIATION</b>	<b>xviii</b>
	<b>LIST OF APPENDIX</b>	<b>xx</b>
CHAPTER	TITLE	PAGE
<b>I</b>	<b>INTRODUCTION</b>	
	1.1 Project Introduction	1
	1.2 Objective	2
	1.3 Problem Statements	2
	1.4 Scope Of Project	2
	1.5 Thesis Outline	3

**II****LITERATURE REVIEW**

2.1	Sirim Label For Regulated Product	4
2.2	Choose The Target Region	5
2.3	Image Resolution	6
2.4	Rgb Image	7
2.5	Grayscale Image	8
2.6	Binary Image	8
2.7	Optical Character Recognition Process	9
2.8	Image Processing	9
2.9	Pre-Processing Of The Image	10
2.9.1	Binarization Process	10
2.9.2	Morphological Process	11
2.9.3	Finding Character Signature	12
2.9.4	Character Segmentation	13
2.10	Templates Database	14
2.11	Character Recognition Using Correlation Method	15
2.12	Creating A Microsoft Excel Database And Import It Into MATLAB	17
2.12.1	Method One : Importing Data From Excel	17
2.12.2	Method Two : Importing Data From Excel	17

**III****METHODOLOGY**

3.1	Introduction	19
3.2	Program Flowchart	20
3.3	Creating Microsoft Excel Database	21
3.4	Create The Templates	21
3.5	Binarization	22
3.6	Morphological Process	24
3.6.1	Fill Holes	24

3.6.2	Dilation Process	26
3.6.3	Median Filtering	27
3.6.4	Thicker The Character	28
3.6.5	Remove Small Object From Binary Image	29
3.7	Evaluation Process	30
3.8	Character Segmentation And Resize Segmented Image Process	32
3.9	Optical Character Recognition Process	33
3.9.1	Correlation And Image Conversion To Text	33
3.9.2	Noise Correlation Problem	34
3.10	Show The Extracted Number	35
3.11	Finding Resulting ID Number In Database	36

## IV

## RESULT AND DISCUSSION

4.1	Introduction	41
4.2	Setup	42
4.3	Start The Program	43
4.3.1	Start Camera	43
4.3.1.1	Original Image Panel	44
4.3.1.2	Binary Image Panel	44
4.3.1.3	Image Acquisition Panel	45
4.3.2	Extract Number Button	45
4.3.2.1	Morphological Process Image	46
4.3.2.2	Vertical Projection Graph	46
4.3.2.3	Segmentation Of Number	47
4.3.2.4	Correlation Process To Convert Segmentation Number Into Text	48
4.3.2.5	Finding The Resulting Number In The Database	48
4.3.2.6	Displaying The Detail	49
4.3.3	Reset Button	50
4.3.4	Select Image Button	51

<b>V</b>	<b>CONCLUSION &amp; RECOMMENDATION</b>	
5.1	Introduction	52
5.2	Conclusion	52
5.3	Project Recommendation	53
5.3.1	CMOS Image Sensor	54
	<b>REFERENCES</b>	55
	<b>APPENDIX A</b>	56
	<b>APPENDIX B</b>	58
	<b>APPENDIX C</b>	62
	<b>APPENDIX D</b>	66

**LIST OF TABLES**

<b>NO</b>	<b>TITLE</b>	<b>PAGE</b>
3.1	Creating Database From Microsoft Excel	21
4.1	Database Table In Microsoft Excel	49

## LIST OF FIGURES

NO	TITLE	PAGE
2.1	SIRIM Label For Regulated Product	5
2.2	Target Region	5
2.3	Image With Different Resolution	6
2.4	Each Pixel Contain Three Corresponding Rgb	7
2.5	Rgb Color Cube	7
2.6	Each Pixel Has Single Number Corresponding To The Gray Level	8
2.7	Grayscale Tonal Scale	8
2.8	Each Pixel Contain Single Bit Number Between 0 And 1	9
2.9	Binary Image Scale	9
2.10	Morphological Process	12
2.11	Character Signature	13
2.12	Character Segmentation	14
2.13	Templates Folder	15
2.14	Digitize Image	15
2.15	Image Array A	16
2.16	Image Array B	16
2.17	Result Of Classification Method	17
2.18	Excel Data Format	18
2.19	Creation Of Variables With The Import Wizard.	18
3.1	Program Flowchart	20
3.2	Templates Folder Been Created	22
3.3	RGB Image	22

3.4	Grayscale Image	22
3.5	Binary Image With Low Threshold Value	23
3.6	Binary Image With High Threshold Value	23
3.7	Result Of Binarization	24
3.8	Filling All Holes That Exist In This Image	25
3.9	Show The Holes That Have Been Filled	25
3.10	Find The Big Holes	25
3.11	Removing The Big Holes	26
3.12	Let Only Small Holes Is Filled And The Big Holes Is Remove	26
3.13	Dilation Process In Binary Image	27
3.14	Result After Dilation And Erosion Process	27
3.15	Result Of Median Filtering In Inverted Image	28
3.16	Connected Component To Be Add The Value 1	28
3.17	Result After Thickening The Character	29
3.18	Result Of Removing Small Object	29
3.19	Region To Be Evaluate	30
3.20	Row = 1 Vertical Projection Graph	30
3.21	Row = 2 Vertical Projection Graph	31
3.22	Row = 3 Vertical Projection Graph	31
3.23	Segmentation Of Letter 'A'	32
3.24	False Segmentation Form Unsuccessfully Morphological Process 'A'	33
3.25	Result Of Segmented And Resized All The Characters	33
3.26	Value Of Correlation Coefficient For Different Templates	34
3.27	Image With Unwanted Component	34
3.28	Segmented And Resized With Unwanted Component	35
3.29	Result After OCR	35
3.30	Converting Table Into Matrix Array	36
3.31	Defining Device Type At Column 2 In Row 1	36
3.32	Defining Manufacture At Column 3 In Row 1	37
3.33	Defining Brand At Column 4 In Row 1	37
3.34	Defining AZ743541C At Column 1 In Unknown Row	38
3.35	Defining Between AZ743541C And Device Type	38

3.36	Defining Between AZ743541C And Manufacture	39
3.37	Defining Between AZ743541C And Brand	39
3.38	Final Output Message Box	40
4.1	Tinytech Webcam	41
4.2	Setup The Webcam	42
4.3	Sirim Sticker Counterfeit Detector Program	42
4.4	Start Camera Button	43
4.5	Matlab GUI After Starting The Camera	43
4.6	Original Image Panel	44
4.7	Binary Image Panel	44
4.8	Two Letter Connected Together	45
4.9	Image Acquisition Control Panel	45
4.10	Extract Number Button	45
4.11	Image After Morphological Process	46
4.12	Accepted ID Number	47
4.13	Rejected ID Number	47
4.14	Segmented ID Number	47
4.15	Recognition Process	48
4.16	Finish Recognize ID Number	48
4.17	Display When ID Number Exist In Database And Consider Genuine	49
4.18	Display When ID Number Not Exist In Database And Counterfeit Suspected	49
4.19	Display When There Is No SIRIM Sticker ID Number Detect In The Image	50
4.20	GUI View After All Process Is Done	50
4.21	Reset Button	50
4.22	Select Image Button	51
4.23	Selecting Image File	51
5.1	CMOS Image Sensor	54



## LIST OF ABBREVIATIONS

2-D	-	2 Dimension Image
BMP	-	Bitmap Image File Format
CMOS	-	Complementary Metal-Oxide Semiconductor
CMY	-	Cyan, Magenta and Yellow Color Model
DSC	-	Digital Still Camera
GUI	-	Graphical User Interface
ID	-	Identification
IP	-	Internet Protocol
MATLAB	-	Matrix Laboratory
MCMC	-	Malaysian Communication And Multimedia Commission
OCR	-	Optical Character Recognition
PSO	-	Particle Swarm Optimization
RGB	-	Red, Green and Blue Color Model
ROI	-	Region Of Interest
SIRIM	-	Standards and Industrial Research Institute of Malaysia
SLR	-	Single lens reflex camera
VGA	-	Video Graphics Array
XLS	-	Excel Spreadsheet
YUY	-	Luminance , blue–luminance and red–luminance

**LIST OF APPENDIXES**

<b>APPENDIX</b>	<b>TITLE</b>	<b>PAGE</b>
A	Project Gantt Chart	56
B	PSM I Slide Persention	58
C	PSM II Slide Persentation	62
D	INOTEK Poster And Certificate	65

## **CHAPTER I**

### **INTRODUCTION**

In this chapter, it represent the introduction of the project. What is the purpose of this project and what is the problem that needs to be solve within some objective need to be fulfil.

#### **1.1 Project Background**

Nowadays, there are many fake or smuggle electronic and electric device have sale in this country. This is harm to the public, because for example without inspection by SIRIM, the possibility of the mobile phone will harm to user such as small explosion occur. The SIRIM sticker means that the devices have been proved and pass the standard and safe to use by public. So, the sticker is been distribute to the dealer so it can sale their product. But if not pass the standard, the device is illegal to be sale. But in modern era, not only the device is been smuggle or been recon, the sticker itself are been counterfeit to obscure the authorities enforcement so that the device and the dealer is not been caught because sale the illegal device. The sticker have a unique code number that been printed for every device. So this project to make the authorities enforcement easy to verify the authenticity of the sticker by capturing the SIRIM sticker and read the code number to show the detail about the device is match to its specification that been insert in database. The method been use is built the Optical Character Recognition (OCR) program by using MATLAB. After

recognition the program will check the extracted number in the database. The database is built in Microsoft Excel. Then it will show the extracted number and its specification. This MATLAB program is only the testing program to ensure this method can check the code number in database. The future work is to make this program to be use more easier is by using 'JAVA Eclipse' so that it is compatible with 'Android' operating system. Therefore, it can fit into the 'smartphone' and can check the code number easily.

## **1.2 Objective**

The main objective of this project is:

- I. To analyze the code number in the SIRIM sticker by using MATLAB.
- II. To develop code number SIRIM sticker database in Microsoft Excel.

## **1.3 Problem Statement**

The SIRIM sticker means that the device has meet the standard and safe to be used. Nowadays, there are many recon or smuggled devices are sales in this country. As well as the SIRIM sticker, it also being counterfeit and stick at the device. The authorities enforcement are difficult to verify the authenticity of the SIRIM sticker. The users are being cheated and think the device is pass the SIRIM inspection.

## **1.4 Scope Of Project**

A webcam is use to capture the image of the SIRIM sticker. The code number image is analyze by using MATLAB. Microsoft Excel is use to keep the database of the code number.

## **1.5 Thesis Outline**

This thesis is arranged to follow the flow of the study and implementation. Chapter II is about Literature Review which is all about the study before implementing it to the project. Chapter III is the Methodology which explains about how the project flows and uses all the study from Chapter II. In Chapter IV, the results after implementing the Methodology are shown, along with how the project works and how to use it. The final chapter explains about future work on the project and recommendations to make the project more successful.

## **CHAPTER II**

### **BACKGROUND STUDY**

In this chapter it represent the process that is use in this project base on existing project such plate number recognition and image to text recognition. However this existing project has their own limitations and contributions. Beside that there are other process needs to be analyze for this project in term of finding the SIRIM ID number in the database.

#### **2.1 SIRIM Label For Regulated Product**

There are two types of SIRIM sticker with it specific label which is one for the Malaysian Communication and Multimedia Commission (MCMC) and others is Energy Commission of Malaysia, Malaysian Road Transport Department and Fire and Rescue Department of Malaysia as we can see in Figure 2.1. In this project, the major objective is to detect the MCMC sticker.



Figure 2.1: SIRIM Label For Regulated Product [1]

## 2.2 Choose The Target Region



Figure 2.2: Target Region

Figure 2.2 shows that the target regions that want to be analyze in this project, the target region is called Region of Interest (ROI). In MATLAB image acquisition, there are program that can be integrate with the camera device or webcam. The recommended resolution use by webcam is “680x480” with YUY2 color format. Therefore the image can be capture and automatically insert in the program that proceed to the further process. The code number of the sticker is analyze by using Optical Character Recognition (OCR) process in MATLAB.

### 2.3 Image Resolution

The meaning of image resolution is amount of pixels use of the image which mean that the more pixels in image can make the image more clearer when more points at which the image in been sampled by measuring its color. The density of pixels in an image is referred to as its resolution. The higher the resolution, the more information the image contains. If the image size is constantly the same and increases the resolution, the image gets sharper and more detailed [2]. Alternatively, with a higher resolution image, it can produce a larger image with the same amount of detail.

Figure 2.3 illustrate what happens as the resolution of an image is been reduced while keeping its size still the same. The pixels get larger and larger and there is less and less detail in the image.



Figure 2.3: Image With Different Resolution